

PROCEEDINGS OF SPIE

Optical Components and Materials XVIII

Shibin Jiang
Michel J. F. Digonnet
Editors

6–11 March 2021
Online Only, United States

Sponsored and Published by
SPIE

Volume 11682

Proceedings of SPIE 0277-786X, V. 11682

SPIE is an international society advancing an interdisciplinary approach to the science and application of light.

The papers in this volume were part of the technical conference cited on the cover and title page. Papers were selected and subject to review by the editors and conference program committee. Some conference presentations may not be available for publication. Additional papers and presentation recordings may be available online in the SPIE Digital Library at SPIDigitalLibrary.org.

The papers reflect the work and thoughts of the authors and are published herein as submitted. The publisher is not responsible for the validity of the information or for any outcomes resulting from reliance thereon.

Please use the following format to cite material from these proceedings:

Author(s), "Title of Paper," in *Optical Components and Materials XVIII*, edited by Shubin Jiang, Michel J. F. Digonnet, Proceedings of SPIE Vol. 11682 (SPIE, Bellingham, WA, 2021) Seven-digit Article CID Number.

ISSN: 0277-786X

ISSN: 1996-756X (electronic)

ISBN: 9781510641990

ISBN: 9781510642003 (electronic)

Published by

SPIE

P.O. Box 10, Bellingham, Washington 98227-0010 USA

Telephone +1 360 676 3290 (Pacific Time) Fax +1 360 647 1445

SPIE.org

Copyright © 2021, Society of Photo-Optical Instrumentation Engineers.

Copying of material in this book for internal or personal use, or for the internal or personal use of specific clients, beyond the fair use provisions granted by the U.S. Copyright Law is authorized by SPIE subject to payment of copying fees. The Transactional Reporting Service base fee for this volume is \$21.00 per article (or portion thereof), which should be paid directly to the Copyright Clearance Center (CCC), 222 Rosewood Drive, Danvers, MA 01923. Payment may also be made electronically through CCC Online at copyright.com. Other copying for republication, resale, advertising or promotion, or any form of systematic or multiple reproduction of any material in this book is prohibited except with permission in writing from the publisher. The CCC fee code is 0277-786X/21/\$21.00.

Printed in the United States of America by Curran Associates, Inc., under license from SPIE.

Publication of record for individual papers is online in the SPIE Digital Library.

SPIE. DIGITAL LIBRARY

SPIDigitalLibrary.org

Paper Numbering: *Proceedings of SPIE* follow an e-First publication model. A unique citation identifier (CID) number is assigned to each article at the time of publication. Utilization of CIDs allows articles to be fully citable as soon as they are published online, and connects the same identifier to all online and print versions of the publication. SPIE uses a seven-digit CID article numbering system structured as follows:

- The first five digits correspond to the SPIE volume number.
- The last two digits indicate publication order within the volume using a Base 36 numbering system employing both numerals and letters. These two-number sets start with 00, 01, 02, 03, 04, 05, 06, 07, 08, 09, 0A, 0B ... 0Z, followed by 10-1Z, 20-2Z, etc. The CID Number appears on each page of the manuscript.

Contents

MODULATORS, DETECTORS, AND FILTERS

- 11682 04 **InGaAs/InP SWIR unipolar barrier photodetector structure** [11682-2]
- 11682 05 **Time-resolved photoluminescence and xenon differential transmission measurement device based on electro-optic deflector** [11682-3]
- 11682 06 **A new concept for spatially resolved coherent detection with vertically illuminated photodetectors targeting ranging applications** [11682-4]
- 11682 07 **Temperature dependency of responsivity and dark current of nearly ideal black silicon photodiodes** [11682-5]
- 11682 09 **Stimulated Brillouin scattering tunable fiber based all-optical filter** [11682-7]
- 11682 0A **Ultra-high refractive index difference optical materials-integration for optical thin-film structures** [11682-8]
- 11682 0B **Optical spectrum fingerprint: a novel application of optics as an encryption-decryption technique** [11682-9]

FIBERS AND WAVEGUIDES

- 11682 0E **First demonstration of a double cladding optical fiber utilizing a graded index multimode inner cladding and a single mode core for enhancing downhole distributed sensing techniques** [11682-12]
- 11682 0F **Elaboration of chalcogenide microstructured optical fibers preform by 3D additive manufacturing (Invited Paper)** [11682-13]
- 11682 0J **Flexible waveguides composed of PDMS based elastomer by pen-drawing technique for printable optics** [11682-17]
- 11682 0K **Fabrication of sol-gel derived cladding for sapphire fibers and their performance evaluation under harsh environment** [11682-18]
- 11682 0L **Improved CMOS-compatible ultra-silicon-rich nitride for non-linear optics** [11682-19]

LASERS

11682 0P **Design and fabrication of low-cost tunable semiconductor swept-source lasers at 850 nm**
[11682-23]

PHOTOLUMINESCENCE MATERIALS

11682 0Q **Flexible photonics: transform rigid materials into mechanically flexible and optically functional systems (Invited Paper)** [11682-24]

11682 0R **Mid-IR emission characteristics of low-phonon erbium-doped ternary chloride-based single crystals** [11682-25]

NANOPARTICLES

11682 0V **Hydrogen detection based on Au-Pd core-shell systems** [11682-29]

11682 0W **Magnetically actuated solid body PDMS lens** [11682-30]

11682 0Y **Impact of PbS quantum dots on GaAs photoluminescence** [11682-32]

PLASMONIC AND SUBWAVELENGTH OPTICAL COMPONENTS

11682 13 **Arrayed graphene enhanced surface plasmon resonance for sensing applications** [11682-37]

11682 14 **Optical super-resolving phase filters with random anti-reflection subwavelength surface structures** [11682-38]

11682 15 **Bidirectional scattering distribution function of random antireflective nano-roughened surfaces**
[11682-39]

SENSING

11682 17 **Raman scattering in single-crystal YAG for application in distributed temperature sensing**
[11682-41]

11682 19 **Reflective long period grating based temperature sensor** [11682-43]

POSTER SESSION

- 11682 1A **The long fiber optic paths to power the thermal field disturbance sensor** [11682-44]
- 11682 1F **Er-Yb co-doped aluminosilicate glass matrix for spectral filtering with a very high absorption in the 0.9-1.0 μm spectral range** [11682-49]
- 11682 1G **High-birefringence chalcogenide all-solid hybrid microstructured optical fiber and broad mid-infrared parametric gain bandwidth** [11682-50]
- 11682 1I **The particle size distribution influence on the spectroscopic performance of CaF_2 dispersed PDMS hybrid materials** [11682-52]
- 11682 1J **Comparative steady-state and time-resolved emission spectroscopy of Mn-doped CsPbCl_3 perovskite nanoparticles and bulk single crystals for photonic applications** [11682-53]
- 11682 1L **Numerical studies on the estimation of carrier lifetime of SOAs from gain-recovery time measurements** [11682-55]
- 11682 1N **Comparison of optical properties of 1x128 splitters based on Y-branch and MMI approaches** [11682-57]